Eco Demonstration Centers

By Roger Kelly, (RK) UK

Artefact. Photo by R.K.

Changing the world in the direction of more sustainable energy practices is a complex and demanding business. There are so many different kinds of people who have to be influenced, from global decision-makers to individual householders, and there are so many different levels of information to be communicated, that a very wide range of techniques needs to be used. The growing numbers of non-profit eco-demonstration centres around the world demonstrate efficiency and renewable energy at work with an effectiveness that no amount of written or even multimedia material can match. This article looks at a small number of these centres, in Europe, from the perspective of someone who was the director of one of them - the C.A.T. in the UK - for 10 years. Each of the centres has its own unique character, but there are also many similarities, particularly in their underlying philosophies. Most, if not all, see energy issues as integral to an ecological approach to human society. They are also concerned with ecologically benign building practices, biological food production, the water and waste cycles, and general resource management. Some are almost purely research organizations that demonstrate the results of their research with the buildings and energy installations they use. Others concentrate mostly on education, but use practical demonstration as an important teaching tool. Others again are open on a daily basis to the visiting public and put their emphasis on communicating basic principles to as wide an audience as possible. Some are concerned with changing the patterns of consumption in the North, others with helping to introduce appropriate technologies to the South. Some have existed for more than 25 years; others are very new.

This brief tour around some of Europe's eco-centres is of necessity, very limited. The descriptions are partly based on my personal experience, partly on descriptions provided by the centres themselves or by others who have visited them.

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C.A.T. UK

Little History: C.A.T. - Centre for Alternative Technology - is one of the earliest centres, established during 1973 in a 16-hectare abandoned slate quarry in the mountains of Mid Wales. Its original aim was to create a new form of sustainable rural community which would experiment with "alternative" technologies and ways of life, then disseminate the results through writing, teaching, and demonstration projects. Almost from the beginning, however, it began to attract growing numbers of casual day visitors. The emphasis shifted to providing a "good day out" for visitors, who were mostly holidaymakers in the area combined with a simple educational approach to the whole range of ecological lifestyle issues.

C.A.T. Photo by R.K.

Visitors: 75,000 people each year - in the summer often more than 1,000 a day.

High level of self-sufficiency: There is a stand-alone electricity generating system comprising hydro, wind power, and a recently installed 13kW photovoltaic roof. Grid-linking allows surplus electricity to be exported. Most of the space- and water heating is provided by a boiler burning local forestry waste. Water for all purposes is supplied from a small rain-fed reservoir. Sewage and waste water are treated on-site by aquatic plant systems, and all organic wastes are composted to build up soil fertility. One of the wonders of the Centre is the extent to which a barren mountain of slate waste has been transformed into an extraordinarily rich and diverse ecosystem containing many species of plants and animals which have long disappeared from the surrounding landscape.

Staff: The Centre is still based on the original vision of a living and working community, run on cooperative principles by a staff committed to education and change.

Courses: 40 courses are open to the public each year. Many of them are about renewable energy.

Publications/outreach: There are thriving publications and consultancy departments, a popular restaurant and shop. C.A.T. is also involved with a new local initiative, the Dyfi Eco Valley Partnership, which aims to turn the whole area into a model of renewable-energy development.

Finance: C.A.T. depends for its financial

survival very much on earned income - from what visitors pay on entrance and what they spend in the shop and restaurant, but also from residential courses, publications, and consultancy.

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The Small Earth, Holland

Little history: Although almost contemporary with C.A.T. (founded in 1972) and with the same underlying philosophy, 'The Small Earth' Center has many differences which result mainly from its location. Far from being in a remote and mountainous rural area, it is on the outskirts of the small town of Boxtel in the southern Netherlands, on an almost entirely flat site with good fertile soil.

Gardens and Buildings: The gardens (although only 1.5 hectares) are the most important part of the demonstration function. The main building contains lecture rooms, kitchen, and offices. 3 demonstration buildings (the Recycling House, the Pyramid House, and the Eco-house) were added between 1973 and 1991. Then, in 1995, a new building was initiated to provide residential accommodation for students (22 beds) as well as a central reception area, shop and café, offices, and storage. This building includes composting toilets, solar water heating, and a photovoltaic roof to the central atrium which supplies about 30% of the building's annual electricity needs.

Small Earth. Photo by R.K.

Visitors: Around 15,000 people a year.

Courses: There are about 20 courses each year mostly on ecologically sustainable gardening and whole-food cookery, but also on sustainable building practices.

Publications/outreach: The Center publishes books about food production, building, and sustainable lifestyles. It is heavily involved in the local Agenda-21 process. It has helped the development of a sister centre in Kenya. It is twinned with a similar centre being implemented in a remote Hungarian village by Hungary's Ecological Institute for Sustainable Development.

Staff: As at C.A.T., the 18 staff work as a cooperative with equal (but low) pay after three years; a 32-hour week in normal for full-time staff, but about 40% of staff work a 24-hour week. There are also some volunteer staff and graduate trainees. Unlike C.A.T., the Center's houses no resident community.

Finance: Income is divided almost equally among government grants, mainly Ministry of Environment for education, donations, and earned income of the sale of vegetables, publications as well as from courses and visitors.

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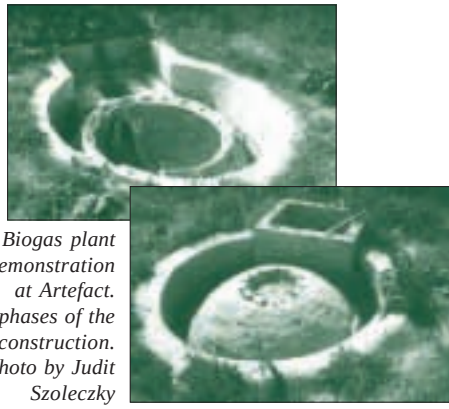
Artefact, Germany

Little history: Situated in the far north of Germany, virtually on the Danish border, Artefact is a non-profit organisation which acts primarily as a training and education centre focused on technology, the environment, development and the "Third World". The centre itself was opened to the public in June, 1995 after a six-year construction period, funded by the Government of the State of Schleswig-Holstein, during which over 300 unemployed young people worked through job creation schemes and more than half of them subsequently found permanent jobs.

Buildings: There is a seminar and conference centre with seminar rooms for up to 50 people and accommodations for up to 24, a cafeteria, and offices. These are built predominantly of earth and timber with some fascinating structural forms, and there is a design philosophy which specifically aims to reduce the use of timber in building as a demonstration for the increasingly deforested areas of the world.

Self-sufficiency: The whole Center was designed to be self-sufficient in energy, generating electricity from wind and solar together with a biomass gasification plant. Heating is provided by solar thermal, backed up by heat recovery from the gasifier and a vegetable oil-fired co-generation system. The wind power system exports to the grid but also runs irrigation pumps for the gardens. The rainwater is collected in underground tanks to be used for flushing toilets and cleaning the buildings. Wastewater is treated in a reedbed system. There is also a composting toilet.



Biogas plant demonstration at Artefact. Different phases of the construction. Photo by Judit Szoleczky

Courses: The Center has a number of its own courses but it also designs training programs, workshops, and conferences on request. The courses cover a wide range of appropriate technical subjects as well as policy issues and educational curriculum planning. It has close links with a two-year postgraduate course at Flensburg University called ARTES (Appropriate Rural Technologies and Extension Skills) and the AT-Association, Bonn, which publishes a magazine, "Appropriate Technology Forum".

Finance: Having had its initial capital investment funded from outside, Artefact now has to be financially self-sufficient. It combines education work with a consultancy business.

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Folkecenter, Denmark

Little History: The Folkecenter for Renewable Energy was established in 1983 to develop renewable-energy technologies that could be manufactured by small or medium-sized businesses to supply local electricity needs. The emphasis, therefore, has always been on hard research aimed at the commercialisation of technology. In this, it has been very successful, spearheading Denmark's dominance in the wind-power industry and, more recently, developing a new biogas industry for Denmark's pig farms. The total area of almost 10 hectares was originally a farm, sloping gently southward towards Skibsted Fjord in the northern Jutland area of Denmark.

Setting up windmill at the Folkecenter. Photo by J. Kruse

Renewable Energy: The wind turbine testing area has a dozen or so small and medium-scale turbines which are constantly monitored and tested as they generate electricity for on-site consumption. Most of the electricity demand is in fact met by a single 75-kW turbine, although there is also an increasing contribution from photovoltaics mounted on existing and new buildings around the site. Other energy technologies which the Folkecenter has experimented with and has demonstrations of include plant oil (mostly rape seed based) as a liquid transport fuel, hydrogen production, biogas, cogeneration, and solar water heating.

Dome. Photo by J. Kruse

Buildings: The main buildings have been developed around the original farmhouse. These contain offices, laboratories, a particularly fine library of reference material, kitchen, dining room, and sleeping accommodations for staff and volunteers. There is also a large engineering workshop building nearby, and this whole area radiates a feeling of technical professionalism. Almost more impressive to the visitor, however, are some of the experimental buildings - the Plus Energy House with its passive solar technology and mobile insulation, the Bio-dome with its aquatic plant treatment system, and the new earth-sheltered Training Centre with its impressive conference hall, library, and dining room. This building also incorporates a pioneering system of integrating PV cells into window glazing, with an expected annual output of 2100kWh from the south-facing facade.

Visitors: There are 10,000 visitors a year.

Courses/education: There are international courses and cooperation projects. Technology applications developed by the Center can be found in several countries all over the world. A 3-6 month training program is offered. Modest stipend available for a number of trainees.

Publications/outreach: There is an impressive list of 130 publications in Danish and English. They are relating to all the technologies with which research and development work has been done.

Finance: Unusually among the eco-centres described here, it is financed almost entirely by Danish central and local government sources, partly with a fixed subsidy for core costs and partly with specific project funding that must be opened to bids regularly.

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Living Earth, France

Little history: In 1979, a non-profit Association was set up in Paris to produce and disseminate information about organic agriculture and horticulture, diet, health, and sustainable lifestyles, all of which were of interest to only a small minority in France at the time. The centrepiece of their work was the publication of a journal on organic gardening which gradually expanded its readership. A longer-term dream was to have a demonstration centre for sustainable living, concentrating on the techniques of ecologically sound landscaping, and this was realised in the early 1990s with the purchase of a 20-hectare site in the beautiful Trièves area south of Grenoble in southeastern France. The basic funding was raised from the publishing activity and from many public bodies.

Landscape: The essentially poor land, used previously only for hunting purposes, now has an astonishing range of displays and habitats, from formal flower and herb gardens to vegetable-growing areas, a composting display, bamboo plantation, ponds, a reedbed sewage treatment system, and wildflower meadows.

Buildings/energy: What is perhaps more surprising, however, is that the buildings and energy technologies are no less important than the landscape. The first main building is passive solar, timber-framed with earth block walls, having beautiful views south over the surrounding area and housing the publishing business, administrative offices, and a shop. Close to this is the restaurant building, a masterpiece of vaulted earth brick construction, cool in summer, warm in winter, and a memorable space in which to eat in. The experience is enhanced, as you would expect in France, by fine cooking, often using plant ingredients which have almost disappeared from culinary use. In 1998, a new display was inaugurated under the name "[néga]watts house", showing how domestic energy consumption could be cut by half, firstly in the design of buildings through orientation, choice of materials, and bioclimatics, then through all the techniques of energy efficiency in use.

Publications/courses: The center's publishing is flourishing and producing an increasing range of books in French. Each year a number of one-day courses are also run, on subjects related to organic gardening and ecological building. The centre is generally open from May to October.

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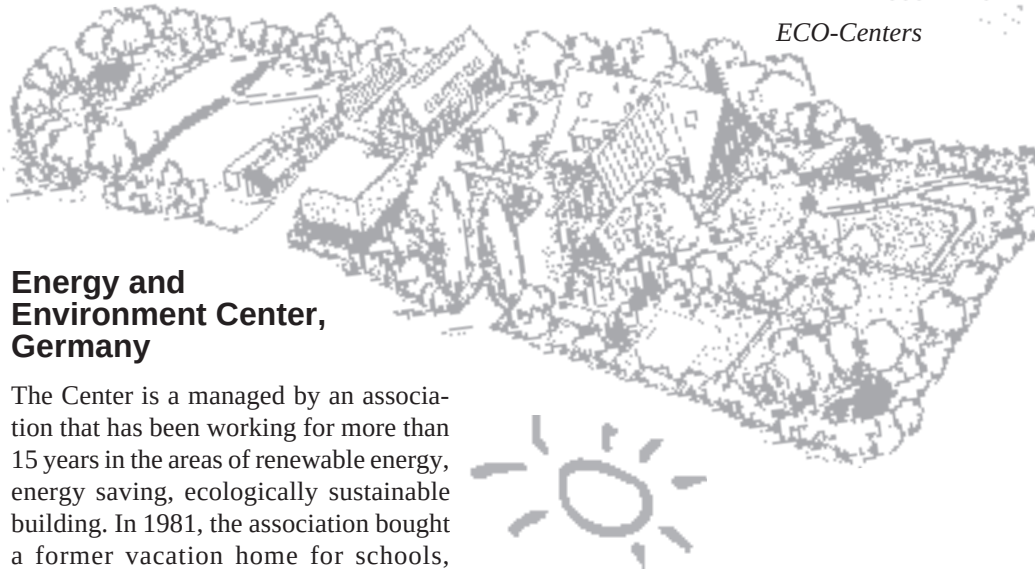
Tingvall's Eco, Sweden

Little history: One of the most recent European eco-centres, Tingvall's Eco is based on an 80-hectare farm in the Bohuslän district of southwestern Sweden. The land has been a demonstration and experimental farm owned by the Swedish Society for Rural and Agricultural Development since 1940. From 1990, it has specifically concentrated on organic milk production from a herd of 55 dairy cattle. More recently, local development groups in the area got support from the local authority to expand Tingvall into a wide-ranging centre for ecology and sustainability.



Buildings/facilities: The design and functioning of the buildings were based on C.A.T.'s experience with its eco-cabins and the principle of a self-contained building ecosystem that can be managed and monitored by the residents. The buildings include composting toilets and a stand-alone energy system using wind, solar, and biofuels, the production and consumption of which are monitored on computers and meters within the buildings. There are a total of 48 beds. Self-catering kitchens are provided, but full board is also offered. The minimum requirement for course participants is that they start the day by stoking the wood stove and preparing their own breakfast. The farm as a whole has also been laid out as an Eco Park where the visitors can also explore the mixture of pasture land, forest, valleys, and the organic gardens. An eco-shop, a café, activities for children, and guided tours are available.

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Eco-Garden, Hungary

"Eco-Garden" is a 5,100 m^2 park situated on an island of the Kis-Duna river. It was started in 1995 by the Nature Association in Esztergom. The members of the Association cleaned the place of illegal wastes and turned it into a showplace. The exhibition area is connected by footpaths to an organic garden, a windmill, a 12-m^2 solar collector, a photovoltaic (PV) system, a composting toilet, and a composting facility. Pupils and children from kindergartens very often visit the garden. They get hands-on experiences in how to restore the natural ecological system. In the summer, people can organize camps with the aim of showing how to protect the environment and nature.

Contact: Esztergomi Környezetkultúra Egyesület, (Nature Association in Esztergom), Széll Kálmán, Bajcsy Zsilinszky road 4. I.e.106, 2500 Esztergom. Hungary. Ph/fax.: +36- 33-400-150, e-mail: eke@zpok.hu, http://www.vjrktf.hu/ekoint/ekoku.htm (in Hungarian).

Children at Eco-Garden in Hungary.

Energy and Environment Center, Germany

The Center is a managed by an association that has been working for more than 15 years in the areas of renewable energy, energy saving, ecologically sustainable building. In 1981, the association bought a former vacation home for schools, which was rebuilt to model ideas in these fields. The building's fuel consumption was reduced by 70 % and the water consumption was reduced by 50 %. This was done by changing the heating system, installing solar panels, and using well-water and rainwater. There are also an 18,000-m^2 reed-bed sewage system, an organic vegetable garden, and an orchard.
Staff: 24 members of permanent staff earn their living by teaching, organizing exhibitions, and consultancy. It is a self-managed, non-profit project.
Courses: 70 courses are offered throughout the year. The guesthouse provides 30 beds and whole-food catering. There is a travelling exhibition for hire on 300 m^2 of open space, a shop with technical literature, publication of books. Every first Saturday in the month is an "Open Door Day". Guided tours are available.

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Eco-Park, Slovakia

Eko-park is a non-profit organization established by three Slovak NGOs in 1996 in the capital of Slovakia, Bratislava. The plan is to build up a 10,000 m^2 area as an open-air exhibition for renewable-energy technology. It will also exhibit most of these technologies available on the Slovak market. At the end of 1998, several developments were completed, and there are further ambitious plans. Presently, the following attracts the visitors attention: a small (1 kW) hydro power plant connected to a hydraulic ram; a small windmill charging a set of batteries and supplying electricity to a TV set, radio, and a few lights; solar water collectors, and a solar cooker. There is a big collection of videos, books, and magazines. Until now, Eko-park has been a Slovakian activity. There is, however, an idea to offer cooperation for Hungarian and Austrian groups or individuals, since the Park is situated within 20 km from the borders of both countries.

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Earth Center, UK

A big and ambitious project, the Earth Centre, is being built in a depressed former industrial area of northern England, on the site of an old coal mine between the towns of Doncaster and Rotherham. The Earth Centre, which is budgeted to cost a total of over 150 million EUROs, sets out to use all the techniques of Disney and the other major Theme Park operators to "promote the understanding of sustainable development and to help people become involved in the process of achieving it in their own lives and for the world". It would be easy to be cynical about such a project if the person behind it, Jonathon Smales, had not been general manager and an international trustee of Greenpeace before taking this on. He has a genuine commitment to the achievement of sustainability but believes a project of this size is necessary to change the millions of people who do not yet take environmental issues seriously. Phase One is due to open this year, so if you are in England, make sure you visit and decide for yourself.

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